**The Effects of Pressure on Dentin Structure Detected by Ultrasonic Waves**

Abstract

Bone is the primary component of our skeletal structure.  Without the skeletal structure, the human body would not be able to achieve its specialized locomotion.  Our bones and teeth share a comparable structure and makeup.  Therefore, by testing dentin, the results are nearly identical to the results of actually testing bone.  Most scientists believe that the structure of dentin is similar to a substance such as honeycomb, which compress when pressure is exerted.  Others may argue that it is a completely solid with very little or no elasticity.  We hope our project will give insight into the answer of this problem.

The specimen for our experiment is a rectangular piece of elephant dentin (elephant tusk).  A specimen of human dentin (tooth) would have been much too small to provide an accurate test.  Elephant dentin is much larger, which provides a much easier object to use for the experiment.  It basically contains the same makeup of human dentin.

As pressure was applied, the velocity of the compressional wave decreased slightly.  However, the velocity of the shear wave increased much higher than the rate of decrease of the compressional wave indicating that the overall velocity of the ultrasonic sound did increase.  Overall, there is a positive association between the pressure applied and the velocity of the ultrasonic sound waves.